

Space Technology Game Changing Development

Monthly Highlights

August-September 2013

Testing of ADEPT Ground Test Article Begins at Ames

Adaptable, Deployable Entry and Placement Technology, or ADEPT, led by NASA Ames, is a flexible woven fabric heat shield that is mechanically deployed. The design is based on a carbon fabric already successfully tested at the Center's Arc Jet facility. When used on a mission, this heat shield would be stowed in a more compact shape until deployed like an umbrella before entering a planet's atmosphere. Such a design would allow exploratory spacecraft larger than the Curiosity rover to successfully land on Venus, Mars, or other planets in our solar system. For Venus missions, due to its low ballistic coefficient, ADEPT will enable delivery of science payloads with peak decelerations of 30 g's, an order of magnitude reduction over heritage entry systems.

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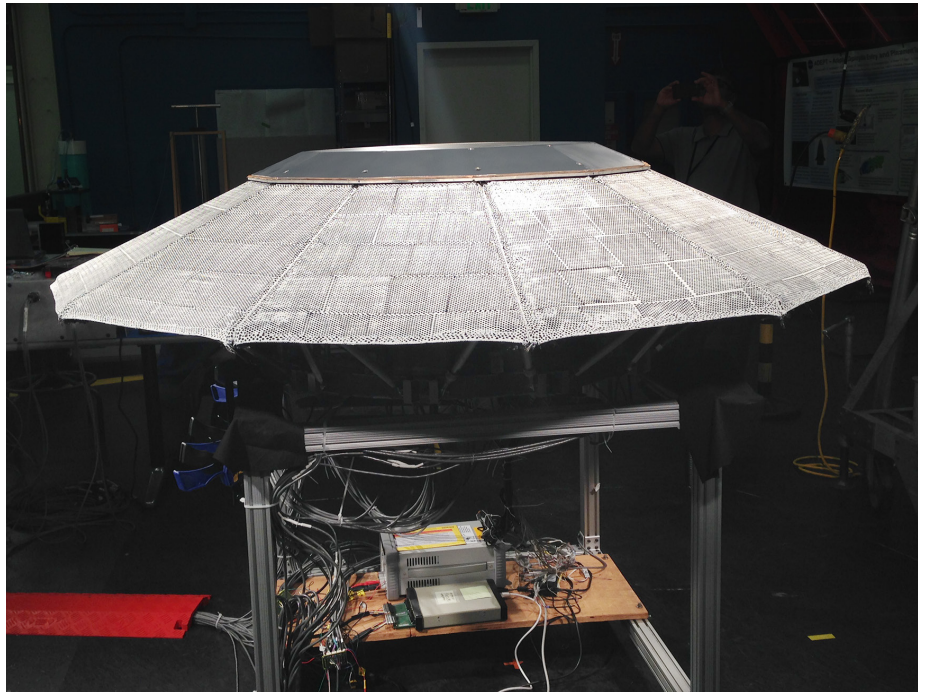
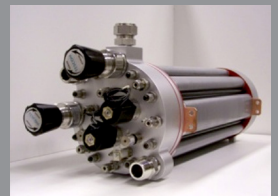
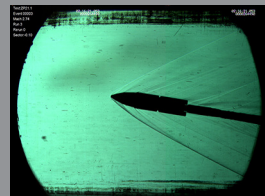


Photo Credit: NASA

Recently, the ADEPT team completed the assembly of the ADEPT Ground Test Article.



ADEPT Ground Test Article

Continued from page 1.

Recently, the ADEPT team completed the assembly of the ADEPT Ground Test Article. All instrumentation of the 2-m demonstration article was successfully installed and fully assembled. Flightlike carbon fabric cloth was integrated with the ribs to create 12-gore assemblies and over 30 successful stow and deploy cycles were completed to understand the integrated system performance.

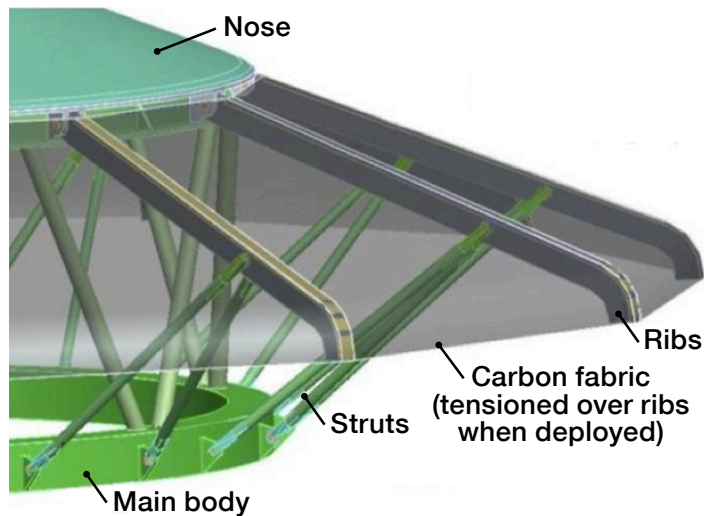


Image Credit: NASA

Mechanically deployable decelerator.

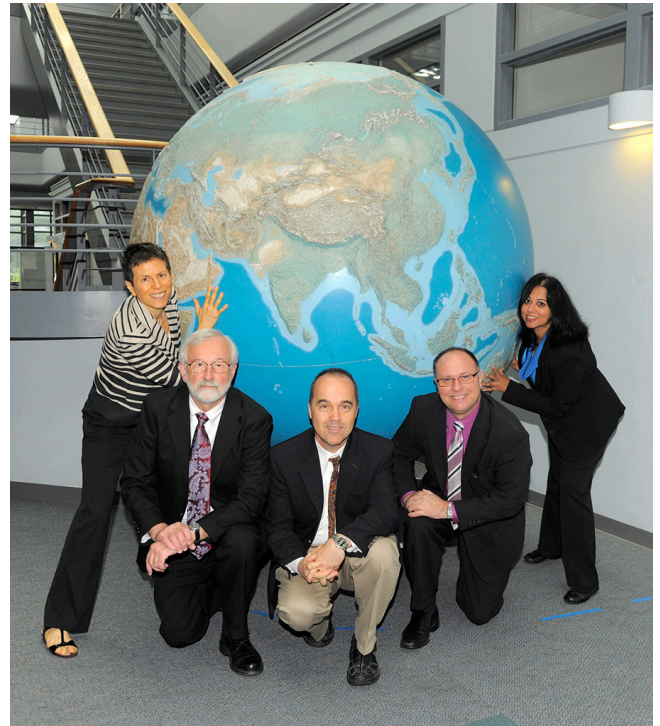
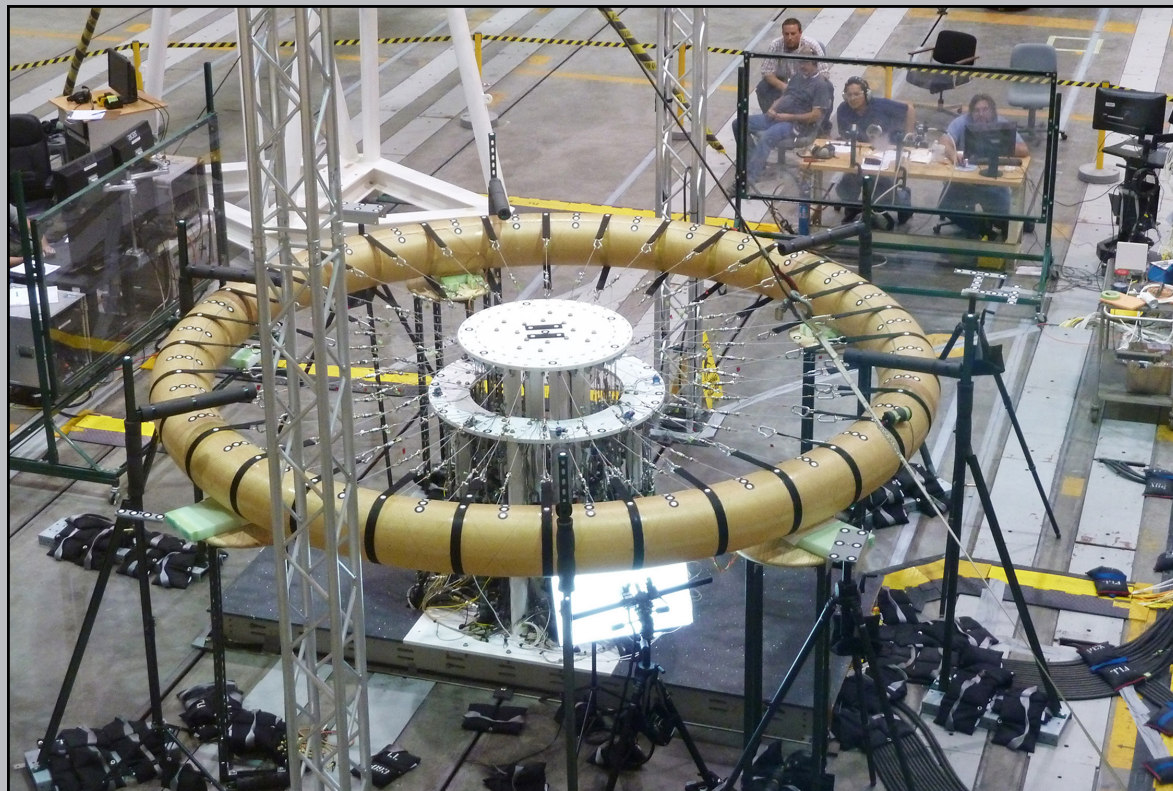


Photo Credit: NASA

From left to right, Rita Sambruna and Wilt Sanders, of the Science Mission Directorate's Astrophysics Division; Tibor Balint and Steve Gaddis of Space Tech's Game Changing Development Program; and far right, Jaya Bajpayee also of the Astrophysics Division, received an Honor Award in recognition of groundbreaking collaboration across directorates.



HIAD Testing at NASA Dryden

HIAD inflatable structure testing began at NASA Dryden in September. Data collected from these tests will anchor the HIAD Structural Model 1.0.

Photo Credit: NASA

Game Changer Recognized at Langley

Materials engineer Mia Siochi from NASA Langley was recently recognized as a top innovator in technology transfer.

Siochi, who works in the Advanced Materials and Processing Branch, received the award at an inventors' breakfast in August for having the most number of new technology reports submitted in 2012 by a Langley employee. The first four of the five technology areas that Siochi reported on (listed below) were related to

her work in Game Changing Development under the Nanotechnology project.

The technology area reports that support Nanotechnology provide perspective on increasing the understanding of what it takes to make structural nanocomposites from carbon nanotube assemblages.

Siochi's work in the fifth technology area on the list is related to research supported by the Aeronautics Research Mission Directorate Seedling Fund.

Mia Siochi's Areas of Technology Transfer

1. In Situ Mechanical Property Measurements of Amorphous Carbon-Boron Nitride Nanotube
2. Sucrose Treated Carbon Nanotube and Graphene Yarns and Woven Sheets
3. Conductive Polymer/Carbon Nanotube Structural Materials and Methods for Making Same
4. Resistive Heating Assisted Epoxy Infiltration (RHA EI) for Epoxy/Carbon Nanotube Structural Composites
5. Enhanced Dielectric Barrier Discharge Body Force Generation Using Nanofoam Material with Infused Catalytic Layer



Photo Credit: NASA

Materials engineer Mia Siochi from NASA Langley was recognized recently as a top innovator in technology transfer.

STMD Administrator Visits Michoud Assembly Facility

Dr. Michael Gazarik, Associate Administrator (AA) for NASA's Space Technology Mission Directorate visited NASA's Michoud Assembly Facility in New Orleans in August. His visit included seeing progress on the facilities and equipment used to manufacture NASA's Space Launch System (SLS) and Orion spacecraft. He toured the vertical weld center and massive robotic weld tools, where state-of-the-art friction-stir welding will be used to manufacture the SLS core stage.

Gazarik also toured NASA's National Center for Advanced Manufacturing (NCAM) and met Richard Koubek, the dean of Louisiana State University's College of Engineering. NCAM is a NASA resource in Louisiana, which supports aerospace manufacturing research, development and innovation and important partnerships with industry and academia.

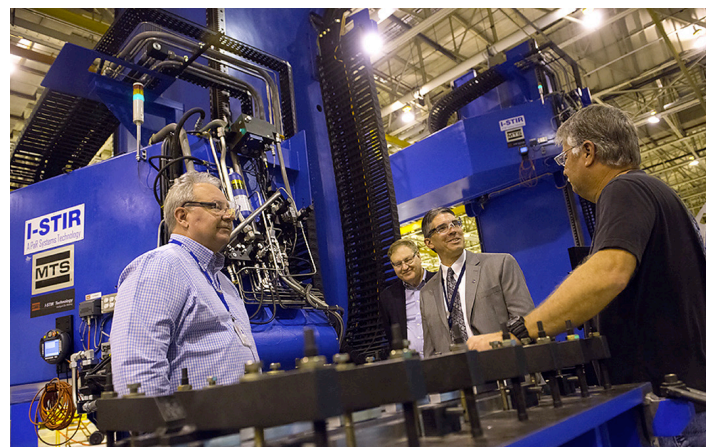


Photo Credit: NASA Michoud Assembly Facility

Dr. Michael Gazarik, AA for NASA's Space Technology Mission Directorate, visited NASA's Michoud Assembly Facility in New Orleans in August.

GCD Students Enjoy Tech-Filled Summer

Game Changing Development Program projects supported more than 150 students this past year—ranging from high school seniors to undergraduates to postdoctorals. NASA's investment in education—

specifically science, technology, engineering, and math, is a top priority within the Agency. Here's a look at some of the interns who got to experience space technology firsthand during summer internships:

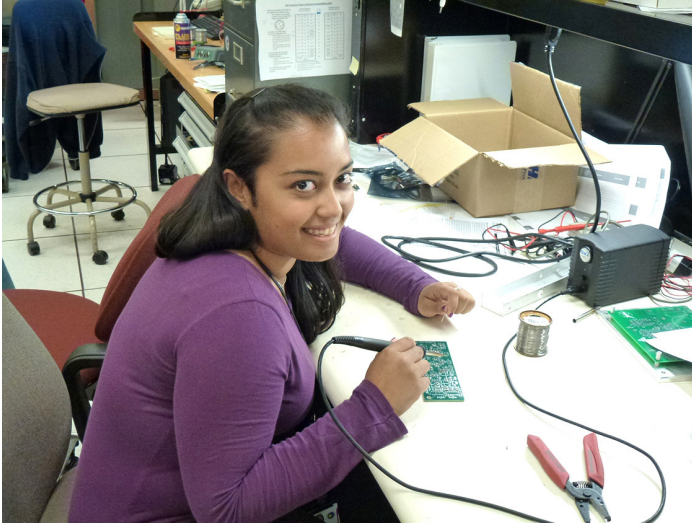


Photo Credit: NASA

Deboshri Sadhukhan, a junior at the University of Akron, supported the Advanced Space Power Systems project this summer. Sadhukhan helped with the testing of the power processing boards as they are fabricated and followed the building of the power processing unit chassis.

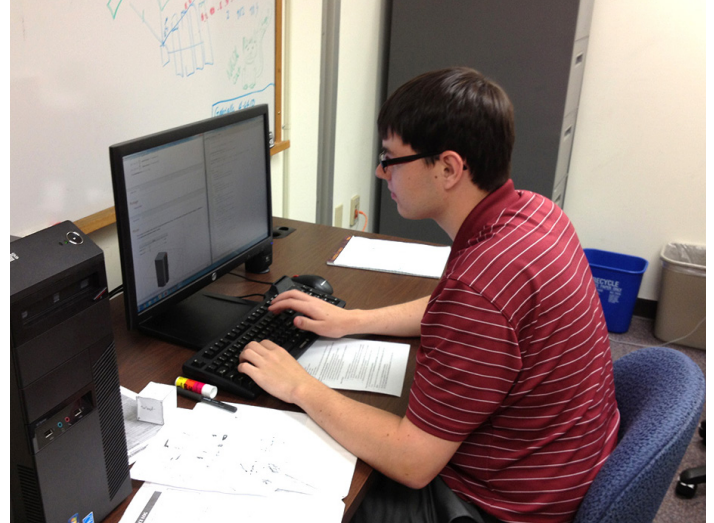


Photo Credit: NASA

Chris Buck, a sophomore computer engineering student at Christopher Newport University in Newport News, Va., helped develop an improved interactive computer model of deployable solar arrays using Mathematica while interning at NASA Langley.



Photo Credit: NASA

Jonathan Reardon, a senior mechanical engineering student, investigated mechanisms for deployment of high-power solar arrays for the Solar Electric Propulsion project.



Photo Credit: NASA

Chris Flatley, a summer intern from Maryland, supported the High Performance Spaceflight Computing task at NASA JPL this summer. Here, Flatley worked on coding a benchmark that will be used to evaluate hardwired designs for a future NASA flight computer.



Photo Credit: NASA

Students who supported the HIAD project at NASA Langley during the summer pose for a picture inside an inflatable torus.



Photo Credit: NASA

Game Changing Program Office interns Ryan Ligon (left), from Virginia Polytechnic Institute and State University, and Joey Donatelli, from Virginia Commonwealth University, supported NASA's successful Tech Day on the Hill in July.

Resource Management Office Summit



Photo Credit: NASA

In August, the STMD Resource Management Office team held its annual summit at NASA Langley where the team focused on improving processes and support of STMD projects.

Game Changing Education and Public Outreach

Marshall's Innovation & Technology Day

The Composite Cryotank Technologies and Demonstration (CCTD) project participated in NASA Marshall's Innovation & Technology Day on Sept. 12. The booth

was manned by CCTD project personnel including John Fikes, deputy project manager; Justin Jackson, project engineer, and Lynn Machamer, project coordinator.



Photo Credit: NASA

MSFC Center Director Patrick Scheuermann visits the CCTD booth.



Photo Credit: NASA

Steve Newton and Jennifer Edmunson of 3D Printing In Zero-G staffed a booth at the MSFC Tech Day. The Manufacturing Innovation Project also exhibited alongside them.

Rockets to Racecars

The Game Changing Development Program Office supported NASA Langley's participation in the Rockets to Racecars event at the Richmond International Raceway.

Here, retired astronaut and current AA for Education at NASA, Leland Melvin, stops by the booth to pose with R2.

Photo Credit: Amy McCluskey



Game Changing Education and Public Outreach

Robots Win Big at Annual Space Conference

NASA's Space Technology Mission Directorate supported the AIAA Space 2013 conference in San Diego in September. At the conference the Robonaut 2 team received the Space Automation & Robotics Award. R2 Project Manager Ron Diftler (left, below) accepted the award on behalf of the team. Game Changing Communications Manager Amy McCluskey staffed the STMD exhibit, which featured an articulated R2 model (right). Diftler also gave a short presentation of the Robo-Glove and demonstrated it for the audience (bottom right).



Photo Credit: NASA



Photo Credit: AIAA Space 2013

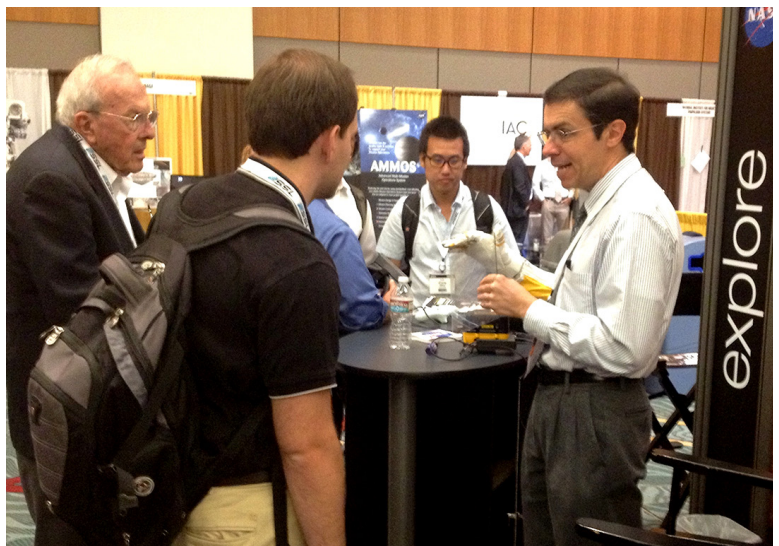


Photo Credit: NASA

Game On!
<http://gameon.nasa.gov>



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